



Introduction to Superfund: A Public Awareness Workshop



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Workshop Provides the Answers to Common Questions

- What is Superfund and how did it begin?
- What happens when contamination is discovered?
- How does EPA determine the amount of contamination? And how to clean it up?
- Who pays?
- Which other agencies/Tribal governments are involved?
- How can the community participate?



Workshop Agenda

- **Superfund History**
- **Community Involvement**
- **Overview of the Superfund Process**
 - **Discovery**
 - **Assessment**
 - **Decision**
 - **Cleanup**
- **Workshop Summary**

Superfund History

What is Superfund and how did it begin?





Superfund History



Love Canal
New York (1978)



Valley of the Drums
Kentucky (1979)



Superfund History

- **Call for government action**



http://battellemedia.com/wp-content/uploads/2012/05/red_phone.jpeg

- **1980 – CERCLA (Superfund)**
 - **Comprehensive Environmental Response, Compensation, and Liability Act**
- **Law giving EPA authority to run Superfund program and take action when contaminated sites are threat to our health and environment**



Goals of Superfund

- **Protect human health and the environment by cleaning up polluted sites**
- **Encourage participation of States and Tribal Governments in Superfund process**
- **Provide opportunity for community engagement**
- **Make responsible party pay for cleanup at Superfund sites**

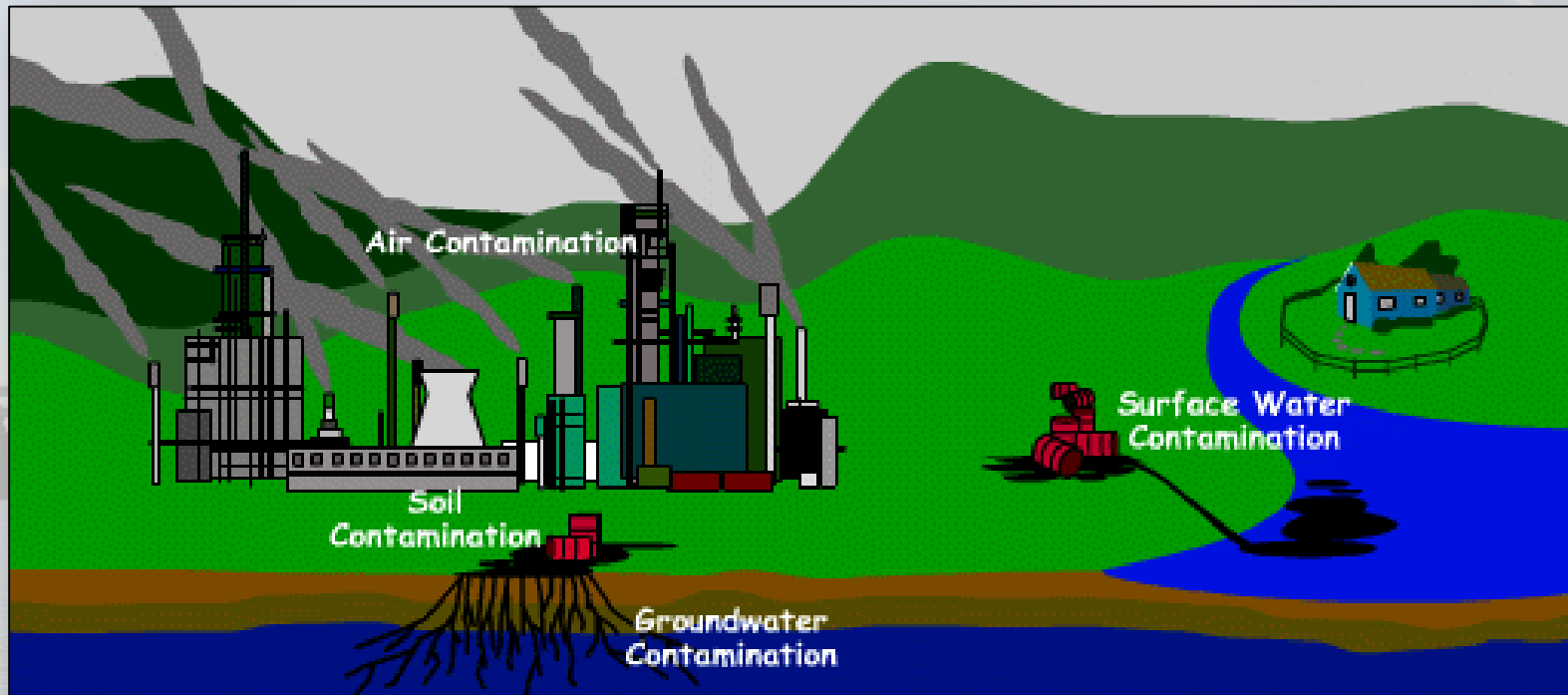


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Hazardous Waste Concerns

- Health effects
- Environmental pollution





Hazardous Waste Concerns

The RESPIRATORY SYSTEM's function is to supply oxygen to the body and remove carbon dioxide. It includes the nasal passages, pharynx, trachea, bronchi, and lungs. Possible health effects of the respiratory system include asbestosis, lung cancer, chronic bronchitis, fibrosis, emphysema, and decreased oxygen supply in blood.

Possible Contaminants

Asbestos
Radon
Cadmium
Benzene
Carbon monoxide
Soot

Where do you find these?

Old insulation
The ground
Old batteries
Degreasers
Car exhaust, unvented or faulty furnaces
Furnaces, wood burning stoves

The RENAL SYSTEM's function is to rid the body of waste, to regulate the amount of body fluids, and to regulate the amount of salts in the body. It includes the kidneys, the urethra, the bladder, and the ureter. Possible health effects of the renal system include decreased formation of urine, decreased blood flow to kidney, decreased ability to filter the blood, prevented urine flow, kidney tissue damage, and kidney cancer.

Possible Contaminants

Cadmium
Lead
Mercury
Uranium
Chlorinated hydrocarbon solvents
(TCE, PCE, PCT)

Where do you find these?

Old batteries, cigarette smoke
Old paint, outdated plumbing
Thermostats, thermometers, some fish
Food & water, proximity to nuclear testing sites
Degreasers, paint removers, dry cleaning solutions

The CARDIOVASCULAR SYSTEM's function is to move nutrients, gases, and wastes to and from the body, to help stabilize body temperature, and to fight diseases and infections by transporting white blood cells to important areas. It includes the heart, blood, arteries, veins, and capillaries. Possible health effects include heart failure and the inability of blood to carry the necessary oxygen to the body.

Possible Contaminants

Carbon monoxide
Carbon disulfide
Nitrates
Methylene chloride

Where do you find these?

Car exhaust, unvented or faulty furnaces
Industrial production
Fertilizers
Auto part cleaners, paint removers

The REPRODUCTIVE SYSTEM's function is to produce egg and sperm cells, to nurture a developing fetus, and to produce hormones. For males it includes the testicles, seminal vesicles, prostate gland, and the penis. For females it includes the uterus, bladder, vagina, Fallopian tubes, ovaries, and the cervix. Possible health effects of the reproductive system include decreased ability to have a baby, increased baby deaths, increased birth defects, and infertility (the inability to have children).

Possible Contaminants

Methyl mercury
Carbon monoxide
Lead

Where do you find these?

Some fish, coal-burning power
Car exhaust, unvented or faulty furnaces
Old paint, outdated plumbing

Sources: National Institutes of Health Household Products Database, <http://fpd.nlm.nih.gov/index.htm>; Agency for Toxic Substances and Disease Registry (ATSDR)'s ToxicFAQs, <http://www.atsdr.cdc.gov/toxfaqs.html>.

The NERVOUS SYSTEM's function is to transmit messages from one part of the body to another. It includes the central nervous system (the brain and spinal cord) and the peripheral nervous system. Possible health effects of the nervous system include inability to move, loss of feeling, confusion, and decreased speech, sight, memory, muscle strength, or coordination.

Possible Contaminants

Arsenic
Cadmium
Carbon monoxide
Cyanide

Where do you find these?

Pressure treated wood
Discarded batteries
Car exhaust, unvented or faulty furnaces
Rat poison

The IMMUNE SYSTEM's function is to protect the body from tumor cells, environmental substances, and invading viruses or bacteria. It includes the lymph system, bone marrow, white blood cells, and the spleen. Possible health effects of the immune system include overreaction to environmental substances (allergy), immune system slow down or failure, and autoimmunity (autoimmunity causes the body to attack itself – which makes it more likely to have an over-reaction or infection).

Possible Contaminants

Mercury
Lead
Pesticides
Polychlorinated biphenyls (PCBs)
Polycyclic aromatic hydrocarbons (PAHs)

Where do you find these?

Thermostats, thermometers, some fish
Old paint, outdated plumbing
Unwashed fruits and vegetables
Industrial waste, fish from contaminated water
Cigarette smoke, vehicle exhaust, asphalt roads

The SKIN serves as a barrier to germs and other substances, prevents dehydration, and regulates body temperature. Possible health effects of the skin include irritation, rash, redness or discoloration, dermatitis, and health effect related to other systems and organs due to contamination through the skin.

Possible Contaminants

Nickel
Mercury
Arsenic
Chromium
Polychlorinated biphenyls (PCBs)
VOC (volatile organic compounds)

Where do you find these?

Cement
Thermostats, thermometers, some fish
Pressure treated wood
Paints, industrial production
Industrial waste, fish from contaminated water
Fumes from gasoline, paint, adhesives, building supplies

The HEPATIC SYSTEM's function is to break down food and store nutrients, to make proteins which are essential for blood to clot, and to purify the body of drugs, contaminants, or chemicals. It includes the liver and its veins. Possible health effects of the hepatic system include liver damage, tumors, accumulation of fat (steatosis), and death of liver cells.

Possible Contaminants

Carbon tetrachloride
Methylene chloride
Vinyl chloride

Where do you find these?

Adhesives
Auto part cleaners, paint removers
Pipe sealer



Portland Harbor History

- **Location?**
- **History? Chemicals found?**
- **Who is potentially responsible for pollution?**
- **Are they involved?**
- **Agencies & Tribal Governments working with EPA?**
- **What are the health and environmental risks?**

Community Involvement

How can you get involved?





Ways YOU Can Get Involved

- Attend public meetings
- Help EPA develop community outreach materials
- Participate in information sessions
- Join/form a Community Advisory Group
- Contact the Site Team or Emergency response hotline to report problems
- *Participate in the public commenting period for documents*





Environmental Justice

- **Fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.**





Exercise

Public Participation

- What would be the best ways to advertise community information workshops?
- How would you make sure that you are reaching out to the diverse communities?
- How would you provide assistance to help the community understand more about Portland Harbor?
- How would you use the public's input to help clean up the River?

Overview of the Superfund Process

A large arched bridge spans a wide river. In the background, a city skyline is visible under a hazy sky. The water in the foreground shows a shimmering reflection of light.

Discovery
Assessment
Decision
Cleanup

Discovery

What happens when a polluted site is discovered?



Site Discovery



**Preliminary
Assessment/
Site Inspection**



**Hazard Ranking
System**



NPL



Site Discovery

- Typically, people or local governments report hazardous waste sites
- EPA investigates
- All important agencies are notified of the conditions at the site



Site Discovery



Preliminary
Assessment/Site
Inspection



Hazard Ranking
System



NPL



Preliminary Assessment

- Learn about the site
- Review site information and history
- Talk with people nearby
- Collect samples



Site Discovery



Preliminary
Assessment/
Site Inspection



Hazard Ranking
System



NPL



Site Inspection



Site Discovery



Preliminary
Assessment/
Site Inspection



Hazard Ranking
System



NPL



Hazard Ranking System

- **EPA calculates and ranks polluted sites based on:**
 - Harm to people
 - Danger to food chain, air, soil, ground water
 - Potential for pollution to spread



Site Discovery



Preliminary
Assessment/
Site Inspection



Hazard Ranking
System

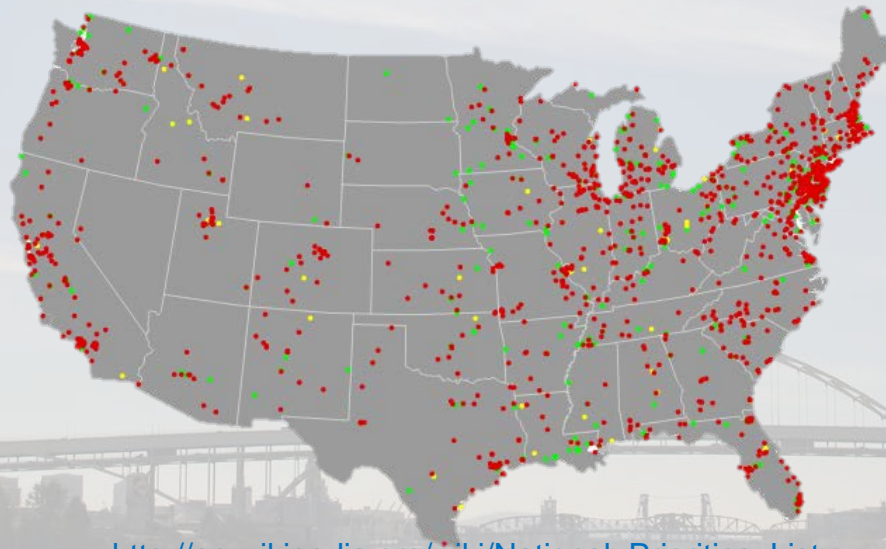


NPL



National Priorities List

- Once on the National Priorities List, a site can receive Superfund money



http://en.wikipedia.org/wiki/National_Priorities_List



Site Discovery



Preliminary
Assessment/
Site Inspection



Hazard Ranking
System



NPL



Portland Harbor Site Discovery

- **Community interviews**
- **Initial testing of soil, water and fish**
- **NPL listing**



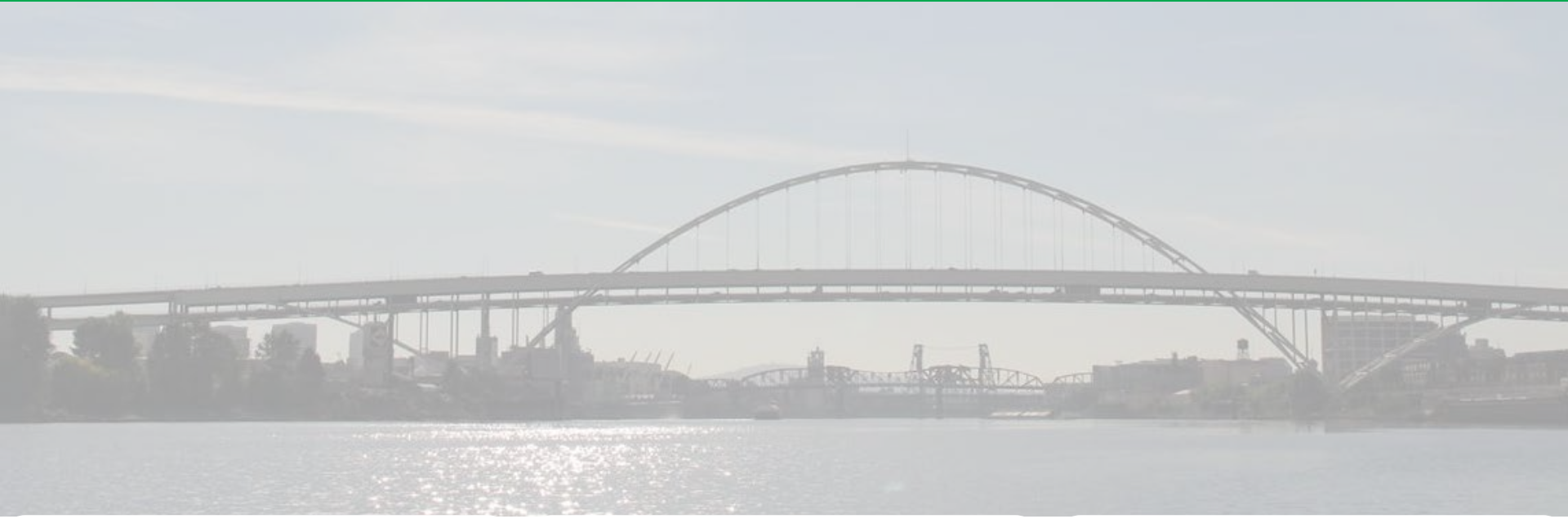
Exercise

Determining Site Hazards

- What would you look for to conduct a preliminary assessment and site inspection?
- Who would you talk with to better understand history at the site?
- What types of information would you research and what would be important to sample and test?
- What would you consider in assessing and ranking the site's hazards for Portland Harbor?

Assessment

How much contamination is there and how do we clean it up?



Remedial Investigation



Feasibility Study



Evaluation Criteria



Remedial Investigation

- Summarize existing information
- Sample surface water, ground water, soil and air
- Determine how much contamination
- Determine if people and/or the environment are affected
- Calculate risk



Remedial Investigation



Feasibility Study



Evaluation Criteria



Feasibility Study

- **Develop cleanup options to address site risks**
- **Options recommended based on:**
 - Effectiveness
 - Cost
 - Whether they will work based on site conditions and existing technology



Remedial Investigation



Feasibility Study

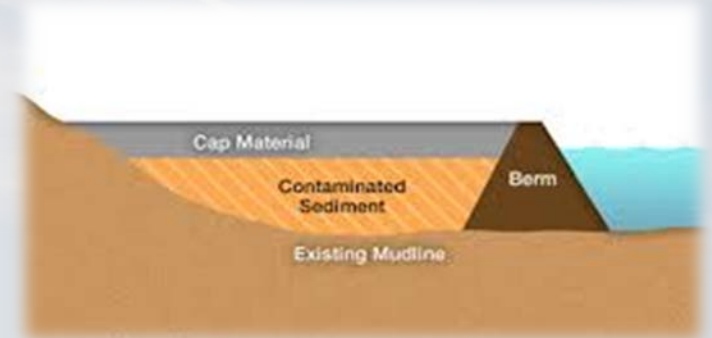


Evaluation Criteria



Remedies (Cleanup Options)

- Treatment such as carbon absorption
- Containment such as capping or barrier walls
- Removal such as dredging or soil excavation





Evaluation Criteria

- **EPA studies each cleanup option to make sure it:**
 - Protects human health and the environment in the long term
 - Meets state and federal requirements
 - Minimizes risks to cleanup workers and communities
 - Reduces risk of the contaminant
 - Is doable and has a reasonable cost
 - Is acceptable to the state and the community



Remedial Investigation



Feasibility Study



Evaluation Criteria



Portland Harbor Site Assessment

- Human Health and Ecological Risk Assessments Completed 2013
Eating resident fish is greatest risk to people and wildlife
- Remedial Investigation, 2015 Target
- Feasibility Study, Under Revision
- Remedies (cleanup options) being considered in FS
 - No action, capping, dredging, monitored natural recovery, innovative technologies
 - Alternatives developed with a mix of cleanup options







Exercise

Clean-up Options (Remedy Selection)

- If you were EPA, what do you think about the different cleanup options based on the evaluation criteria?
- Which option(s) do you think would work best? Why?

Decision

What happens after the evaluation of cleanup options?



Proposed Plan



Record of Decision

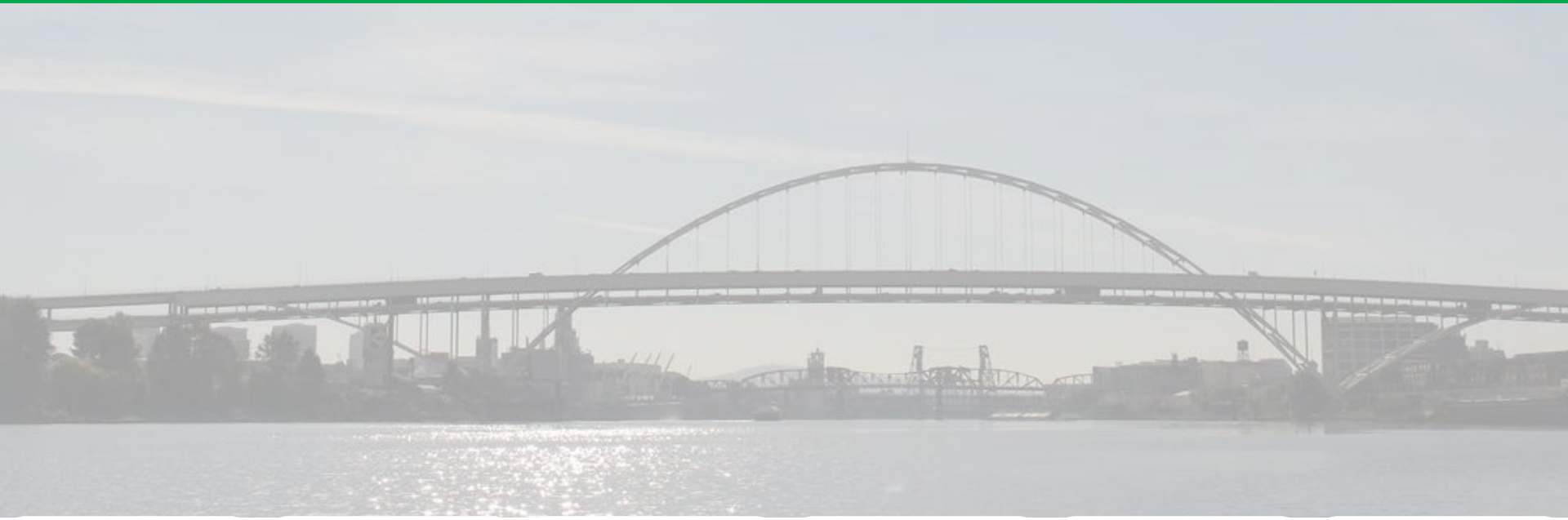


Portland Harbor Decision Phase

- **Proposed Plan anticipated in 2016**
- **Public comment period**
- **ROD anticipated in 2017**
- **Job readiness program in 2017**

Cleanup

What happens after a remedy is selected?



Remedial
Design



Remedial
Action



O&M



Five Year
Review



Reuse and
Redevelopment



NPL Deletion



Workshop Summary

- **Superfund's main goal is to protect human health and the environment**
- **EPA promotes community involvement during all Superfund cleanup phases**





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Thank you!





Remedial Design

- **Develop plans and details for the chosen cleanup option**
- **May include additional sampling**



**Remedial
Design**



**Remedial
Action**



O&M



**Five Year
Review**



**Reuse and
Redevelopment**



NPL Deletion



Remedial Action

- Actual cleanup of site takes place



Remedial
Design



Remedial
Action



O&M



Five Year
Review



Reuse and
Redevelopment



NPL Deletion



Operation and Maintenance

- **Make sure the required equipment is installed and that the cleanup activities continue to work**



Remedial
Design



Remedial
Action



O&M



Five Year
Review



Reuse and
Redevelopment



NPL Deletion



Five-Year Review

- Is the cleanup working?
- EPA meets with the community to discuss concerns and receive input
- Performed every five years



Remedial
Design



Remedial
Action



O&M



Five Year
Review



Reuse and
Redevelopment



NPL Deletion



Reuse and Redevelopment

Ryeland Road
Arsenic Site (PA)



Whitewood Creek
(SD)



Remedial
Design



Remedial
Action



O&M



Five Year
Review



Reuse and
Redevelopment



NPL Deletion



National Priorities List Deletion

- A site is deleted when Operation and Maintenance is completed
- EPA will:
 - Issue a public notice
 - Have a public comment period
 - Respond to public comments



Remedial
Design



Remedial
Action



O&M



Five Year
Review



Reuse and
Redevelopment



NPL Deletion



Exercise 4

Reuse and Redevelopment

- If you were EPA, what would you check for during 5-Year reviews to make sure the cleanup is working?
- How would you reach out to and keep in touch with the community after the cleanup is complete?
- What do you think is important when considering the reuse of Portland Harbor?
- What types of reuse and redevelopment would you like to see in Portland Harbor?

Reference Slides





Environmental Justice: Treating Everyone Fairly (cont'd)

- **Former President Bill Clinton established Environmental Justice as a national priority (Executive Order 12898) to ensure “fair treatment of people of all races, cultures, and incomes regarding the development of environmental laws, regulations, and policies”**



Additional Environmental Justice Information

- **Contact EPA's Regional Environmental Justice Representative**
- **EPA Office of Environmental Justice**
 - <http://es.epa.gov/oeca/main/ej/index.html>
- **National Environmental Justice Advisory Council (NEJAC)**
 - <http://es.epa.gov/oeca/oej/nejac/>



How Sites Qualify for Superfund

- EPA has criteria to evaluate and rank polluted sites
- This process determines if a site is eligible for Superfund money



Site Discovery



Preliminary
Assessment/Site
Inspection



Hazard Ranking
System



NPL List



Hazard Ranking System

- **A standard system to score the potential risk of a hazardous substance at a site**
- **The system evaluates the following:**
 - How harmful is the substance?
 - Does the substance threaten the human food chain?
 - Does the substance threaten the air or soil?
 - Does the substance threaten the ground water?
 - Is the substance migrating from the source?

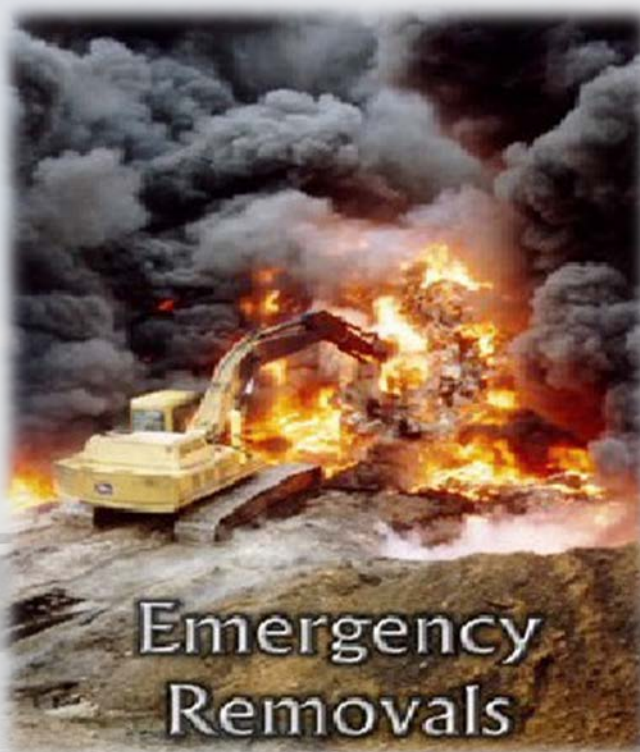


Hazard Ranking System (cont'd)

- **Sites scoring at or above a regulatory established level are proposed for the National Priorities List**
- **This means the site qualifies for Superfund resources**



Removal Actions





Remedial Response



Responses



Remedial Investigation



Feasibility Study



Evaluation Criteria



Removal Action Emergencies

- Include hazardous waste spills that require immediate attention
- These are limited, short-term response actions to address situations such as:
 - Tanker spills
 - Leaking drums
 - Drinking water contamination



Removal Action Emergencies (cont'd)

- **Time-Critical Actions** – Those actions where, based on an evaluation of the site, EPA determines site activities must be completed within six months
- **Non-Time Critical Actions** – Those actions where, based on an evaluation of the site, EPA determines on-site activities must be completed within six months to two years



Types of Response

- There are two basic types of response that EPA uses to address polluted sites:
 - Removal Actions (short-term)
 - Address emergency spills
 - Remedial Actions (long-term)
 - Address complex sites



Responses



Remedial
Investigation



Feasibility Study



Evaluation
Criteria



Remedial Actions Non-Emergencies

- Address contamination that does not pose immediate threats to public health or the environment
- Long-term actions



Remedial Investigation



Feasibility Study



Evaluation Criteria